

C respectively. For this device, in general, N inputs produce 2N-1 outputs, one of which has all N wavelengths properly routed and the rest of the outputs forming N-1 pairs of complimentary beams. For example, output 1 only received $\lambda = 830$ nm, while output 1* receives $\lambda = 865$ and 900 nm. By combining these pairs of complimentary beams, the full routing function is accomplished. Although 2x1 couplers could be used to combine the beam pairs, it is well known that this type of beam combining incurs a 3dB penalty. In order to circumvent this penalty, we used two add/drop filters F1 and F2 with different passbands to re-combine the two pairs of complimentary output beams. In this application, two inputs are multiplexed onto a single output, one input being reflected by the filter and the other being transmitted through the filter.

In The Claims:

Claims 2, 3, 4, 5, 7 and 11 amend to read as follows:

2. (Amended) The improvement of Claim 1, wherein said diffraction grating is augmented by elements selected from the group consisting of coupler and wavelength selective elements to provide fully non-blocking interconnection.
3. (Amended) The improvement of Claim 2, wherein said coupler is selected from the group consisting of directional couplers and wavelength-selective couplers.
4. (Amended) The improvement of Claim 3, wherein said coupler comprises a wavelength-selective coupler which comprises an optical wavelength add-drop multiplexer.

5. (Amended) The improvement of Claim 1, additionally including a second diffraction grating position to receive outputs from said first mentioned diffraction grating.

7. (Amended) The improvement of 6, additionally including a collection optic assembly positioned to receive outputs from said second diffraction grating, and a plurality of filter modules positioned to receive outputs from said collection optic assembly.

11. (Amended) The improvement of Claim 5, additionally including at least one collection and re-direction optic assembly position to direct inputs to said first-mentioned diffraction grating, and a retro-reflector assembly position to receive outputs from said second diffraction grating and reflect certain of said outputs back through said diffraction grating.